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Acceptance of the 1995 A.N. Richards Award

MAURICE B. BURG

Thank you, Dr. Ullrich for your kind remarks. I am pleased and honored to receive this award, and I especially appreciate your participation because of my long admiration for you and our long friendship. It also thrills me to share this occasion with Dr. Morel, for whom I also have the highest regards.

The occasion makes me recall the many talented scientists who have inspired, befriended, and helped me through the years. Their number has become so great that I cannot acknowledge and thank them all individually in the time I have. However, I will at least show you their names and specifically recall some of those who were most influential.

I owe my initial introduction to kidney research to John Merrill, in whose department at the Peter Bent Brigham hospital I spent a month as a fourth year student at Harvard Medical School. My next direct encounter with renal research was as a medical resident at the Boston VA hospital. Maurice Strauss was the Chief of Medicine. His enthusiasm for renal investigation had attracted such talented researchers as Saul Papper and Jack Rosenbaum. My first scientific paper involved renal clearance studies on veterans, work which followed their instruction and encouragement. Jack Rosenbaum, in particular, was recognized as a rising star in kidney research, and was an important mentor to me. Tragically, he developed a fatal cancer that year, and his career was cut unfortunately short.

This was at the time when the Korean war was ending. Like many other young physicians I was drafted into the army and ordered to report to Fort Sam Houston for basic training. Dr. Strauss rescued me by contacting Jack Orloff at the National Institutes of Health (NIH), who arranged for me to transfer instead to the Public Health Service and do research in the Laboratory of Kidney and Electrolyte Metabolism (LKEM), which he headed, in the National Heart Institute. I have remained there ever since.

At this point I must express my gratitude to the NIH intramural program, which has supported me for all these years. I think it is especially appropriate to express those feelings now that NIH, including the intramural program, is under attack, threatened by the general budgetary stringency that affects our federal government.

A marvelous aspect of the intramural program has been to allow young scientists to satisfy their curiosity, contributing to scientific progress while providing them with the pleasure of achievement (all this without the pressure of raising money). The result has been some extraordinary scientific advances, including several Nobel Prizes. The intramural program not only accepted me despite my inexperience as a scientist, but allowed me to pursue almost immediately my own curiosity about how the kidney works. My approaches seemed at the time unlikely to succeed, at least to anyone but myself. Yet the government spent the first of what has turned out to be millions of dollars on my research with very little in terms of restrictions and limitations. My hope is that at least some of this trust in individual scientists can survive the seemingly inevitable down-sizing of NIH and the increasing bureaucratization that is likely to accompany it.

Bob Berliner and Jack Orloff were the leaders of LKEM when I first arrived there. They set a tone of enthusiasm for research, encouraging us to do our best, but giving us searing criticism when we lagged. For those of you who remember Jack Orloff, searing criticism is a mild term to describe his reaction to pretense or inadequate science.

At NIH I have had many fellows and collaborators (Table 1), each of whom I would acknowledge individually if I had time. This is a list in chronological order of those who studied renal tubule function with me. I remain grateful to them. I would especially like to mention Maurice Abramow and Jared Grantham, who were my first fellows. Together with Jack Orloff, the four of us had the thrill of figuring out how to perfuse isolated renal tubules. Maurice and Jared have remained my lifelong friends, even as they went on to more academic achievements and scientific triumphs, but I like best to recall their camaraderie during those heady days in the 1960's. Certainly, I am much indebted to them. Another, who merits special mention, is Nordica Green. She was my loyal and capable technician through many years of tubule perfusion studies and then renal cell cultures. She retired several years ago, leaving a large void in my laboratory life.

Mark Knepper has remained in LKEM. He has taken over the Renal Mechanisms Section, which used to be mine, continuing the studies of renal tubule function with superb skill and vigor. With Mark to continue to study renal tubules, I was able to expand my interests to apply to the kidney some of the other exciting new developments in science. As my expanding interests exceeded my background, I became increasingly dependent on the skills and enthusiasm of new associates (Table 2), who did the actual work that allowed us to explore the new worlds of renal cell culture and of the biochemistry and molecular biology of osmotic regulation. Again, I would like to acknowledge all these collaborators individually, but can take the time only to mention a few specifically.

Joe Handler and I have known each other since childhood and through the years in NIH, until he left to head the renal unit at Johns Hopkins. We have shared innumerable experiences through the years, and he remains perhaps my closest friend in science. He was the one who introduced cell culture to our laboratory and

Table 1. Coauthors in studies of renal tubules

Jack Orloff	Thurman McKinney
Maurice Abramow	James Bourdeau
Jared Grantham	George Schwartz
Sandy Helman	Yasuhiko Iino
Leon Isaacson	Walter Czaczkes
Juha Kokko	Gerald Vurek
Bruce Tune	Lal Garg
Clifford Patlak	Mark Knepper
Gustavo Frindt	Antonio Almeida
Nordica Green	David Good
Michael Horster	Juan Garcia-Aust
David Potts	Robert Star
Larry Stoner	James Atkins
Jean Cardinal	Jeffrey Garvin
Michael Lutz	Kimio Tomita
David Warnock	Ira Kurtz

Table 2. Coauthors, renal cell cultures and osmoregulation

Nordica Green	Brian Martin
Joseph Handler	Benjamin Cowley
Sarah Sohraby	Paul Yancey
James Turner	Joan Ferarris
John Johnson	Moo Kwon
Serena Bagnasco	Brooks Robey
Robert Balaban	Atushi Yamauchi
Henry Fales	Shinichi Uchida
Shunya Uchida	Krzysztof Zablocki
Peter Kador	Eugene Kwon
Jenifer Bedford	Kyu Jung
William Harris	Chester Williams
Helen Murphy	David Sheikh-Hamad
Takeshi Nakanishi	Eugenia Peters
Arlyn Garcia-Perez	Fred Smardo
Toshiki Moriyama	Agnes Preston

pioneered many of the developments in it, making it relatively easy for me to enter this field.

Arlyn Garcia-Perez is the most recent addition to our permanent staff. She introduced us to the exciting world of molecular biology, which is transforming much of what we now do.

Last, but not least, I want to acknowledge the loving support of my wife Ruth, who is sitting there beaming in the front row. Ruth, thank you for your loving backing during all of these years.

Mr. President, Dr. Ullrich and all the others participating here, I want to thank you again for this great honor. Although I have been in science for a long time and enjoyed it immensely, this occasion is certainly a highlight for me.